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Spatiotemporal Variation in Surface Water Quality of the Tunggak River Basin, Malaysia

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Abstract

Water quality and identification of water pollution sources is very important for water resources protection in the river basins. In this study, comprehensive analysis and standard methods were used to evaluate the spatiotemporal variation of water quality in the Tunggak River basin. The assessment of water quality and spatial data for statistical analysis at 10 stations indicated that water quality in the study basin could be classified into pollution to highly pollution levels. The water quality in the wetland and upstream of the study area was polluted. On the other hand, due to the industrial activities the mid and down streams of the Tunggak River basin were serious (highly polluted). Based on Water Quality Index Malaysia (WQI) value, the pollutant contents of surface water were in descending order of stations 7>5>3>2>6>4>8>10>1>9. The temporal variation in water quality of the Tunggak River basin revealed that the studied water quality variables had significant temporal differences ($p < 0.01$) and spatial variability ($p < 0.01$). Water temperature, total dissolved solids, turbidity, total suspended solids, ammonia-cal nitrogen and phosphate were important for the temporal variation in water quality of the study area. These results suggested that the water pollution resulted from industrial and domestic wastes and agricultural runoff had the significant impacts on surface water quality.

Key word: Water pollution, WQI, Water resources, industrial waste water, Tunggak River